Soil Sampling Protocols & Procedures
5000 Highway 37 North
Libby, Montana 59923

Purpose

The purpose of this document is to describe the protocols and procedures to be utilized in the 2002 construction season for clean fill imported into the Parker's property (former Screening Facility) to date and for new clean fill and topsoil to be imported this construction season

The U S Department of Transportation, Volpe National Transportation Systems Center (Volpe Center) will oversee soil sampling procedures in Libby, Montana This document explains the soil sampling procedures and testing methods to be utilized during the 2002 restoration season

Sampling New Fill Material at Borrow Pits

Agricultural fill material will be excavated from the borrow pit, screened, as necessary, through a 3-inch screen and stockpiled at the pit for sampling prior to delivery to the site If during excavation at the borrow source it is apparent that the soil does not contain material larger than 3 inches, the soil will not be screened * The stockpile will be sampled using a backhoe to dig a test pit Each sample will be scraped from the sidewall of a test pit which extends at least 2/3 the depth of the stockpile The scraping operation will collect approximately 60 to 80 pounds of material that is then placed on a tarp Cobbles and boulders larger than 6 inches found in the quadrant will be documented by size and numbers and discarded from the sample An onsite geotechnical testing laboratory will be set up to conduct sieve analyses with hydrometer analyses for the agricultural fill material Material meeting the specifications for agricultural fill will be delivered to the site and placed in areas where soil is required to meet final grades as shown on the site restoration plans The specifications for agricultural fill are as follows

> Agricultural Fill shall be composed of 20-40% sand, 10-25% clay and 50-70% silt and be classified as a silt-loam by the US Department of Agriculture classification system

Structural fill material will be excavated from the borrow pit and stockpiled at the pit for sampling prior to delivery to the site Sieve analyses and Proctor tests will be performed on the structural fill Material meeting the specifications for structural fill will be brought in to areas designated for gravel roads as shown on the site restoration plans Structural material will also be placed and compacted in areas where the proposed residential dwellings and leaching fields are to be installed as shown on the site restoration plans The specifications for structural fill are as follows

> Structural Fill shall be gravel, sandy gravel, or gravelly sand free of organic material, loam, wood, trash, snow, ice, frozen soil, and other objectionable material and shall be graded within the following limits Sieve 6 inches – 100% passing, No 4 – 20 to 70% passing, No 200 – 0 to 10% passing

*Sieve analysis and oversight on site will serve as second and third tier insurances of not delivering material larger than 6 inches to the site

As shown on the site restoration plans, gravel roadways will be a minimum of 12 feet wide A minimum of 24 inches of structural fill material will be placed in 12-inch lifts to a minimum depth of 12 inches below final roadway surface Each lift will be compacted using vibratory compaction techniques and nuclear density testing will be performed to verify compaction to 95% density Gravel roadway surfaces will consist of a minimum of 12 inches of crushed base course, Type A, Grade 6, as specified in Table 701-8 of the Montana Department of Transportation Standard Specifications for Road and Bridge Construction, 1995 Edition, as amended Type A Grade 6 base course will be placed in 6-inch lifts and each lift will be compacted to 95% maximum dry density Nuclear density testing will be performed to verify compaction of each lift

Pit Inspections and Tracking

Pit inspections will be conducted periodically throughout the day while fill material is being brought onto the site Random inspections will occur a minimum of two times a day and whenever material appears to vary from previous loads The import of fill will be tracked by the collection of receipts for each truckload of clean fill and topsoil

Sampling Existing Soil

Existing conditions of material placed on your property last year will be sampled through the use of test pits The proposed areas for test pits are shown in Figure 1 The final locations and number of test pits will be coordinated with the restoration contractor and the property owner

Test Pits

Test pits will be dug to verify that 3 feet of agricultural fill exists in all areas to receive topsoil and hyrdoseed, excluding leaching areas Each sample will be scraped from the sidewall of the test pit One sample will be obtained from each test pit and analyzed at the onsite lab by sieve and hydrometer analyses If the material does not meet specifications it will be removed so that 3 feet of appropriate material can be provided The removed soil will be used off-site

Soil Ripping

Three (3) feet of agricultural fill will be brought in to replace the removed material that does not meet specifications If the material does not meet specifications it will be removed and used off-site A subsoiler will be used to till the soil to a depth of 36" Once the material is tilled, it will be lightly graded using a small bulldozer

Topsoil and Hydroseed

Topsoil material will be excavated from the approved topsoil location, stockpiled and sampled Samples will be analyzed using agronomical analyses Topsoil material meeting specifications will be brought in to a depth of 6 inches over areas where the soil has been tilled and graded Once topsoil is placed, hydroseed will be applied to the site in accordance with the site restoration plans The specifications for topsoil are as follows

> Topsoil shall conform to Montana Public works Standard Specifications Section 02910 Use topsoil that is loose, friable, loamy soil, free of excess acid and alkali containing not less that 4% nor more than 20% organic matter as determined by the loss on ignition of oven dried samples (Reference ASTM

D-2974) Topsoil shall not contain objectionable amount of sod, hard lumps, gravel, sub-soil or other undesirable material that would form a poor seedbed Government sampling will include analysis for nutrient levels, concentrations of organic matter, percent of cation exchange capacity (CEC), and soil texture The clean topsoil will be capable of producing natural vegetation Before stripping topsoil, assure it has supported growth of healthy crops, grass or other vegetable growth

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REMARKS